Integrating Narrative into Engineering Decision Making

Dr. Cameron A. MacKenzie, Dr. Kris Bryden, Anna Prisacari, Daniel Bell
Simulation, Modeling, and Decision Science
Ames Laboratory
Ames, IA USA
camacken@iastate.edu, kabryden@iastate.edu, annacari@iastate.edu, djbell@iastate.edu

***Abstract*— Engineering decision making and design requires collaboration between groups from different disciplines each with different tools, vocabulary, and concerns. Communicating and managing information is critical throughout the decision making process. Traditional engineering decision making tools are generally based on understanding the decision makers' values, modeling uncertainty with probability, and selecting the alternative that maximizes utility. The engineering design process is an iterative process of exploration in which the problem is better understood and the detailed solution created over a period of time. Traditional engineering decision making tools often fail to provide an adequate information framework for decision makers and stakeholders.**

Narrative, a basic means of human communication, may aid in engineering communication and comprehension. Today interactive narrative systems are used as frameworks that enables artists to dynamically create content for movies and games. Narrative theorists have developed a structure for thinking about the creative process. Narrative requires agents of change and events, and narratives usually have a timeline, purpose, and meanings that unfold over time.

The narrative is remarkably similar to the iterative engineering design process as described by many writers. Engineering decision making can benefit from the interactive narrative system by constructing a framework and software that links various aspects of design together to help decision makers understand and direct the overall decision making process. Establishing a shared narrative among stakeholders can encourage collaboration among people and experts from different backgrounds and disciplines. The goal of this work is to develop an interactive narrative system for engineering decision making.

Keywords—complex systems; decision science; narrative theory